between calculation periods. At this time, if an output frequency is low, the calculation period with respect to the cycle of the sine wave becomes sufficiently short, which allows the sine wave to be divided into fine intervals. Therefore, deviation from the sine wave is small even by the linear complement, but if the output frequency is high, the calculation period becomes comparatively long. Therefore, in the conventional technology, it becomes difficult to approximate a fine curve of the sine wave, which causes the deviation from the sine wave to become significant.

The present invention has been achieved in view of the above problems, and it is an object of the present invention to obtain an inverter device capable of approaching the waveform of an output voltage closer to a sine wave irrespective of whether output frequency is high or low, as compared with the conventional technology, and of reducing the processing load of a CPU that calculates an output voltage command.

DISCLOSURE OF INVENTION

In the present invention, an inverter device includes an output-voltage calculating unit that calculates a plurality of output voltage command values in which amplitudes are the same as each other but only phase advances under a fixed condition, based on a frequency command value for driving a motor and a state quantity of the motor, in each calculation period; a PWM-pattern generating unit that is a semiconductor integrated circuit that includes a unit that temporarily stores each of the plurality of output-voltage command values output by the output-voltage calculating unit; a unit that reflects the plurality of output-voltage command values stored, in a

triangular wave signal in time-series order; and a unit that outputs a PWM signal based on the result of the reflection; and a switching unit that switches a direct voltage according to the PWM signal output by the PWM-pattern generating unit and supplies an alternating voltage with a predetermined frequency to the induction motor.

According to the present invention, the output-voltage command value in which only the phase advances is updated a plurality of times within a calculation period. Therefore, even if there are a small number of calculation periods in the cycle of a fundamental wave of an output voltage, it is possible to obtain an output voltage with a waveform closer to the sine wave. Therefore, the current ripple is reduced more as compared with the conventional technology, thus achieving torque ripple reduction and efficiency increase. Furthermore, a CPU that calculates an output voltage command only needs to add a function of calculating a plurality of output voltage command values in which only phase advances, and by previously setting the timing of updating a voltage command in a semiconductor integrated circuit, update of the voltage command a plurality of times can be executed without performance of processes in the CPU. Therefore, the processing load on the CPU can be reduced, thus, there is no need to use an expensive CPU.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a diagram of the comparison between a changing waveform of an output voltage command that is actually desired to be output and a changing waveform of an output voltage command that is actually output;

Fig. 2 is a diagram of the comparison between an output voltage waveform and a sine waveform;

Fig. 3 is a block diagram of the configuration of an